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COMMEMORATION OF THE INTERNATIONAL GEOPHYSICAL YEAR

AUGUST 17, 1982.—Ordered to be printed

Mr. FUQUA, from the Committee on Science and Technology,
submitted the following

REPORT

[To accompany H. Res. 514, which on June 23, 1982, was referred jointly to the Committee on Post Office and Civil Service and the Committee on Science and Technology]

The Committee on Science and Technology, to whom was referred the resolution (H. Res. 514) to commemorate July 1, 1982 as the twenty-fifth anniversary of the International Geophysical Year and to reaffirm the commitment of the House of Representatives to international cooperation in the sciences having considered the same, reports favorably thereon without amendment and recommends that the resolution do pass.

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I. PURPOSE OF THE RESOLUTION

Recognizing the importance of the International Geophysical Year (IGY) to the enhancement of international scientific cooperation, the resolution calls for commemoration of the twenty-fifth anniversary of the beginning of IGY. The resolution further calls for reaffirming the House of Representatives' commitment to continued efforts of international cooperation in all the sciences.

II. HISTORICAL NOTES: THE INTERNATIONAL GEOPHYSICAL YEAR AND THE INTERNATIONAL POLAR YEARS

The IGY and its predecessors were planned and coordinated by non-governmental international scientific organizations. For the IGY, the group was a Special Committee of the International Council of Scientific Unions, with membership from the principal individual scientific unions concerned with the earth's environment—the International Unions for Geodesy and Geophysics (IUGG), for Radio Science (URSI), for Astronomy (IAU), and for Physics (IAPAP). There was also very active liaison with and participation by inter-governmental organizations, notably the World Meteorological Organization and UNESCO. There were national committees in the Academy of Sciences in each of the 67 participating countries and obviously strong support from governments. The IGY was the largest and most comprehensive cooperative program in science ever undertaken.

The IGY opened up the Antarctic, initiated the Space Age and gave a lasting stimulus to cooperative efforts in all the scientific disciplines concerned. The planning and coordination of the antarctic research continued after the IGY under SCAR, a new scientific committee of ICSU; another ICSU committee, COSPAR, continued and tremendously expanded the IGY-initiated program in rockets and satellites. The successor programs in solid earth geophysics—more focused than for the IGY—were the Upper Mantle Project (1962–1970), the World Magnetic Survey (1962–1968), the Geodynamics Project (1970–1979), and now the new International Lithosphere Program (1980–1990).

In the solar-related geophysical sciences, the IGY (which by plan took place at the maximum of the 11-year sunspot cycle) was complemented by the International Years of the Quiet Sun (1964–65) so that a comparable data base could be obtained at sunspot minimum. Then in addition to various smaller coordinated programs, these disciplines, under a continuing ICSU committee, participated in the International Magnetospheric Study (1967–79), the Solar Maximum Year program (1979–81) and now the Middle Atmosphere Program (1982–1985).

In oceanography, new post-IGY committees of ICSU (SCOR) and UNESCO (IOC) have sponsored several oceanographic programs, programs, especially the International Decade of Oceanic Exploration and the Indian Ocean Expedition. The succeeding international programs in meteorology have made much use of the IGY experience; most notable is the Global Atmospheric Research Program.

A major legacy of the IGY is the continued international exchange of geophysical data through the World Data Centers under the auspices of the ICSU Panel on World Data Centers on behalf of all the unions and committees concerned with geophysical investigations.

Thus the IGY, itself the successor to the example-setting Polar Years, has stimulated programs and experiments in all fields of the earth's environment in space and in space science itself. It introduced new techniques in cooperation—the special or scientific committees of ICSU entrusted with action program planning, and coordination, as a supplement to the more disciplined and standards-oriented scientific unions. And the IGY introduced the mechanisms for orderly sharing of detailed observational data as a new dimension to the traditional sharing of scientific results through publication. The IGY also initiated the modern concept of a highly visible, focused program of limited duration which has been effectively emulated in many parts of geophysics, in other areas of science and indeed in many other areas of social or human activity.

The years 1982 and 1983 mark the anniversaries of major and pioneering programs of international cooperative activities in scientific studies of the earth and its environment—geophysics in the broadest sense.

The First International Polar Year took place 100 years ago in 1882–83. Eleven countries conducted expeditions, mostly in the Arctic and sub-Arctic, making measurements of the earth's magnetic field, the aurora, the weather. The most commonly cited result was the first delineation by Fritz of the auroral zone (the circum-polar band about 10° wide where aurora is visible on almost every clear night).

The Second Polar Year, 50 years ago in 1932–33, was planned as a follow-up to the first, using the new techniques, improved instruments and the better logistical possibilities. Again geomagnetic and auroral programs dominated but there were also expeditions to study for the first time the behavior of the ionosphere in high latitudes, using the newly devised radio probing techniques. The second IPY was planned and coordinated by the International Meteorological Organization.

Twenty-five years ago, in 1957–58, the International Geophysical Year was organized on a much larger scale. It involved 67 countries with world-wide (global) networks or surveys in 14 scientific disciplines in all aspects of the earth's environment. The IGY started the coordinated study of physical environment (and geographical exploration as well) of the south polar regions, and the direct exploration of the near-space environment in its Rocket and Satellite program. The IGY resulted in a huge, coordinated data base in geomagnetism, ionosphere, aurora, airglow, cosmic rays, together with the first virtually 24-hour watch on solar flares, sunspots, and other types of solar activity. There were coordinated programs in seismology, gravity, geodesy and oceanography which greatly increased our description and understanding of the earth and oceans. The data base of upper air meteorology and ozone was given a major assist through the IGY program. Most importantly, the IGY initiated the planned voluntary sharing of data through the system of World Data Centers.

The data record of the IGY and some results of early interpretations are reported in the 48-volume "Annals of the IGY" (Pergamon Press 1957–70). The first two volumes include a record of the organizational activities and retrospective articles on the two International Polar Years.

III. ACCOMPLISHMENTS OF THE IGY

The following is a list of the most notable accomplishments ascribed to the IGY in testimony before the Committee by Dr. Thomas Malone:

Initiation of the space age.—The first correct theory of rocket action put forward by K. E. Tsiolkovsky at the end of the 19th century had reached a stage of development that made possible the use of satellites for scientific investigations and it was as an integral part of the IGY. The first artificial Earth satellite was launched in 1957 by the USSR as a part of its program for the IGY. How well I remember the high hopes of those of us who met in Vienna, Austria, fourteen years ago this month at the United Nations Conference on the Exploration and Peaceful Use of Outerspace that this powerful new scientific tool could be directed exclusively to peaceful purposes. While that objective has been accomplished with remarkable success in meteorology, the corresponding meeting in Vienna this month cannot possibly realistically entertain the hope of those of us who gathered there fourteen years ago.

Spawning a series of international programs involving collaborative efforts among the scientists of more than five dozen countries which have illuminated natural phenomena in the atmosphere, the oceans, the earth, and outerspace. A partial list of these programs is provided in Attachment A, extracted from the records of the Geophysics Research Board of the National Research Council.

The IGY led directly to a series of programs that gained acceptance and deeper understanding of the notion of "continental drift" which had been advanced during the last century, but lay neglected and unappreciated because of the lack of observations. This concept has fundamentally changed our insight into the history of planet Earth.

The notion of a voluntary sharing of data which has undergirded scientific research and persisted successfully through the stresses and strains of the quarter century that has elapsed since IGY. Even as recently as within the past year, Soviet and U.S. scientists held productive conversations on the smooth operation of major data centers maintained in the Soviet Union and in the United States.

Strengthening of the international institutions which foster the communication and cooperation which are the very essence of science. The International Council of Scientific Unions has grown from a barely viable institution to one that now has promise of maintaining the unity of the scientific community which is going to be so crucial during the increasingly scientific technological era that lies ahead during the next century. The fact that the International Council is a nongovernmental organization facilitates communication among scientists during times of stress and strain among governments.

Underscoring the emerging concept that putting new scientific knowledge to good use was completely compatible with the exalted position traditionally held by activities intended to expand our storehouse of scientific knowledge. It has taken us nearly a half century to appreciate the comment of Dr. H. R. Kruyt in addressing the Second General Assembly of the International Council of Scientific Unions in Amsterdam that "... scientific research implies an ethical responsibility ... knowledge is inevitably a thing that may lead to evil as to good." This statement takes on the character of an imperative as we wrestle with problems of ethics and morality in coping with the nuclear age spawned by scientific discoveries in the early part of this century.

Laying the ground work for the Antarctic Treaty which permitted an uninterrupted era of exploration of that vast continent and within the foreseeable future will present a new challenge to the interweaving of sciences and diplomacy.

IV. LEGISLATIVE HISTORY OF THE RESOLUTION

H. Res. 514 was introduced by Mr. Wirth for himself and Mr. Fuqua, Mr. Flippo, Mr. Scheuer, Mrs. Bouquard, Mr. Walgren, Mr. Glickman and Mr. Gore on June 23, 1982. The resolution was referred jointly to the Committees on Post Office and Civil Service and Science and Technology.

Testimony was heard before the Committee on Science and Technology on August 3, 1982. The following witnesses testified: Hon. Timothy E. Wirth; and Dr. Thomas F. Malone, Director, Holcomb Research Institute, Butler University, Indianapolis, Indiana.

On August 3, 1982, the Committee on Science and Technology met for the purpose of marking up the resolution. The resolution was unanimously agreed to and ordered reported favorably to the full House.

V. COST AND BUDGET DATA

The resolution does not provide for authorizing any new appropriations. Therefore, there are no cost or budget implications in connection with the passage of the resolution.

VI. EFFECT OF LEGISLATION ON INFLATION

In accordance with rule XI, clause 2(1)(4) of the Rules of the House of Representatives, this legislation is assessed to have no adverse inflationary effect on prices and costs in the operation of the national economy.

VII. CONGRESSIONAL BUDGET ACT INFORMATION

This resolution provides for no new authorization and consequently the provisions of section 308(a) of the Congressional Budget Act of 1974 are not applicable. No authorization for State or local financial assistance is included in the resolution.

VIII. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Because the resolution provides for no authorization of funds an estimate by the Congressional Budget Office is not applicable.

IX. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to Clause 2(1)(3), Rule XI of the Rules of the House of Representatives, under the authority of Clause 2(b)(1) and Clause 3(f), Rule X, the Committee's oversight findings and conclusions are reflected in the recommendations found in the present resolution and report.

X. SUMMARY OF COMMITTEE ON GOVERNMENT OPERATIONS FINDINGS AND RECOMMENDATIONS

Pursuant to Clause 2(b)(2), Rule X, and Clause 2(1)(3), Rule XI of the Rules of the House of Representatives, no findings or recommendations have been submitted by the Committee on Government Operations for inclusion in this report.

XI. CHANGES IN EXISTING LAW MADE BY THE RESOLUTION, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, no changes in existing law are made by the resolution, as reported.

XII. COMMITTEE RECOMMENDATIONS

A quorum being present, the Committee ordered favorably reported the resolution, H. Res. 514 by unanimous vote and recommends its approval.

